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HELMINTHOLOGICAL ABSTRACTS

incorporating

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For the Year 1949

COMMONWEALTH BUREAU OF AGRICULTURAL PARASITOLOGY
(HELMINTHOLOGY)

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FOR THE YEAR 1950

Vol. 19, Part 1

1—Agricultural Gazette of New South Wales.

a. ANON., 1950.—" Drenching sheep for worms. Some important precautions." 61 (3), 166.

2—American Journal of Tropical Medicine.

a. PALMER, E. D., 1950.—" A note on the treatment of strongyloidiasis with intravenous gentian violet." 30 (1), 91–92.
b. HEILMANN, C. G., 1950.—" Enterobiasis among patients in the Roanoke Veterans Adm. Hospital." 30 (1), 93–95.
c. HEWITT, R., KENNEY, M., CHAN, A. & MOHAMED, H., 1950.—" Follow-up observations on the treatment of Bancroftian filariasis with hetrazan in British Guiana." 30 (2), 217–237.
d. MOST, H., KANE, C. A., LAVIETES, P. H., SCHROEDER, E. F., BEHM, A., BLUM, L., KATZIN, B. & HAYMAN, Jr., J. M., 1950.—" Schistosomiasis japonica in American military personnel: clinical studies of 600 cases during the first year after infection." 30 (2), 239–299.

(2a) Of 45 consecutive cases of strongyloidiasis who received intravenously 20 ml. of 0·5% solution of gentian violet daily for 20 days, injected slowly, 41 were cured by one course. The remainder were cured by a second course begun as soon as larvae were again found in the stools. There were no untoward effects. The solution was made in triply distilled water, filtered three times through sterile laboratory filter paper and kept for not more than five days in sterilized bottles. R.T.L.

(2b) Of 1,460 patients examined by NIH swab, 176 (11·98%) were found infected with *Enterobius vermicularis*. In one ward housing deteriorating patients who were not able to take care of themselves the incidence was 64·6%. R.T.L.

(2c) A follow-up of a large group of Guianese with microfilariae who had been treated with hetrazan showed negative counts in 60% of the cases observed for 14 months and a drastic reduction in those who did not remain microfilaria-free. Local or general systemic reactions in some patients during treatment suggested the release of filarial protein with an accompanying allergic response. There was strong circumstantial evidence that the adult worms were also killed by hetrazan. Of 39 patients with elephantiasis only five showed almost complete recession of swellings after treatment, with no significant symptoms. R.T.L.

(2d) This detailed study covers many aspects of schistosomiasis japonica as seen in American military personnel including (i) the incidence of symptoms, chief physical signs and haematological findings in the early chronic stages, (ii) the relation between clinical severity at onset and the distribution of the total white cell counts and eosinophilia. Clinical hepatitis occurring in ten patients was indistinguishable from infectious hepatitis. Skin tests with 1 in 5,000 dilution of cercarial antigen were positive in 53 out of 54 patients. Stool examination for eggs by water centrifugal sedimentation was compared with other methods and considered the technique of choice as it requires no chemical reagents and the minimum amount of standard laboratory equipment. A comparison of fouadin and tartar emetic revealed no significant difference in the number of failures or the time interval to failure. Contrary to the observations of others no change was noted

in the heart rate during antimony therapy. Certain electrocardiogram changes represent only a transient side-action of antimony. The paper concludes with a section on differential diagnosis, criteria for treatment or retreatment, prognosis and recommendations for after-care. R.T.L.

3—American Journal of Veterinary Research.

a. TODD, A. C., KELLEY, G. W. & HANSEN, M. F., 1950.—"Critical tests with sodium fluoride as an anthelmintic for ascariasis in horses." 11 (38), 26–28.
b. MARTIN, H. M., 1950.—"Observations on the anthelmintic value of substituted phenolic compounds in dogs." 11 (38), 58–69.

(3a) Sodium fluoride was administered as a drench to 20 suckling, weanling and yearling horses as an anthelmintic for ascarids. Tested on 10 horses at 2·5 gm. per 100 lb. body-weight, the drug was 99·8% efficient; 89·4% of the worms were dead on expulsion. With 1·5 gm. per 100 lb., given to 10 horses, only 61·7% of the worms were expelled and only 49·3% of these were dead. Immature and mature ascarids were equally susceptible. Moderate to severe diarrhoea, moderate gastritis and enteritis, haemoconcentration, leucocytosis and haemolysis followed treatment, but the diarrhoea was considered a desirable feature as it prevented possible occlusion or the absorption of toxic substances from the dead worms. Owing to the risk of severe diarrhoea and of haemolytic action the use of sodium fluoride for horses is not at present recommended. R.T.L.

(3b) Of 26 substituted phenolic compounds tested for anthelmintic properties on dogs, ten were found to have some value in removing ascarids, hookworms and tapeworms but none was effective against whipworms. Their structural formulae, physical state and melting or boiling points are tabulated. 4-tert.-butylphenol gave poorer results than those reported by Lamson and by Enzie. Mixed 2-amylphenol (secondary and tertiary) at 0·1 c.c. per lb. body-weight removed all the ascarids from four dogs and all the hookworms from two dogs, and is worthy of further study. Indanylphenol expelled 100% of ascarids from two dogs when given at the rate of 0·1 gm. per lb. body-weight but was ineffective against hookworms and whipworms. 6-tert.-butyl-*m*-cresol (which is being reported upon later), 2-tert.-butyl-4-bromophenol, and 3,5-dimethyl-4-chlorophenol showed sufficient promise to warrant further study. In these investigations no definite relationship could be established between chemical structure and anthelmintic activity. R.T.L.

4—American Midland Naturalist.

a. DUBOIS, G. & RAUSCH, R., 1950.—"A contribution to the study of North American strigeids (Trematoda)." 43 (1), 1–31.
b. BYRD, E. E. & DENTON, J. F., 1950.—"The helminth parasites of birds. I. A review of the trematode genus *Tanaisia* Skrjabin, 1924." 43 (1), 32–57.
c. SELF, J. T. & McKNIGHT, T. J., 1950.—"Platyhelminths from fur bearers in the Wichita Mountains Wildlife Refuge, with especial reference to *Oochoristica* spp." 43 (1), 58–61.
d. MAYHEW, R. L., 1950.—"Studies on bovine gastro-intestinal parasites XV. The length of life of the adult nodular worm and hook worm in the calf." 43 (1), 62–65.

(4a) Of 14 species of Strigeidae collected from avian hosts in Ohio, Michigan and Wisconsin, seven are described as new. *Strigea macroconophora* n.sp. from *Buteo jamaicensis borealis* is differentiated from the Australian *S. glandulosa*. *Cotyluris brevis* n.sp. from *Nyroca affinis* has been confused with *C. cornutus*. *C. medius* n.sp. from *Sterna hirundo* is the North American counterpart of *C. pileatus* of Eurasia. The remaining new species are: *Diplostomum repandum* n.sp. from *Sterna hirundo*, *Neodiplostomum buteonis* n.sp. from *Buteo jamaicensis borealis*, and *Uvulifer semicircumcisus* n.sp. and *U. magnibursiger* n.sp. from *Megaceryle alcyon*. R.T.L.

(4b) An examination of the urinary tract of 120 birds belonging to 13 species, 8 families and 3 orders gave 28 infected with 131 specimens of Eucotylidae. A study of this material and of the literature of this group has convinced Byrd & Denton that these

flukes belong to a single genus *Tanaisia* in which they recognize four valid species: *T. atra* n.comb., *T. bragai* n.comb., *T. fedtschenkoi* and *T. zarudnyi* n.comb. Their avian hosts and geographical distribution are tabulated. It is pointed out that the absence of a ventral sucker does not constitute a valid basis for assigning a sexually mature trematode to the Monostomata, and that the actual existence of that order is questionable. R.T.L.

(4c) A large collection of helminths from the Wichita Mountains Wildlife Refuge, Cache, Oklahoma, included *Taenia taeniaeformis, Dipylidium caninum* and *Mesocestoides latus* from *Felis domestica* (feral house cat), *Taenia pisiformis* from *Canis latrans* (coyote), *Mesocestoides latus* and *Oochoristica mephitis* from *Mephitis varians* (striped skunk), *Mesocestoides variabilis* from *Spilogale interrupta* (spotted skunk), *Rhopalias macracanthus* from *Didelphis virginiang*, and *Mesocestoides latus* from *Procyon lotor*. The specimens of *Oochoristica* which showed a number of characters overlapping *O. mephitis* and *O. oklahomensis* are referred to *O. mephitis* because of its priority. R.T.L.

(4d) A calf kept under controlled conditions in a cage was given infective larvae of *Oesophagostomum radiatum* on 24th June, 1944. The first eggs were passed on 31st July and were observed up to the following September, i.e. for a period of 14 months. During this experiment [however] very small numbers of larvae were given on 26th and 30th May, and 15th and 27th July, 1945. Observations on the faeces of three calves kept under similar conditions showed that *Bunostomum phlebotomum* lived as long as 8½, 9½ and 24 months after the commencement of egg production. R.T.L.

5—Annales de Parasitologie Humaine et Comparée.

a. BUTTNER, A., 1950.—"Première démonstration expérimentale d'un cycle abrégé chez les trématodes digénétiques. Cas du *Plagiorchis brumpti* A. Buttner 1950." **25** (1/2), 21–26.
b. ARVY, L., 1950.—"Données cytologiques et histochimiques sur l'hématophagie chez *Haplometra cylindracea* Zeder 1800." **25** (1/2), 27–36.
c. BEVACQUA, R. & WIRTH, A., 1950.—"Kyste de la cavité orbitaire dû à *Filaria conjunctivae* Addario." **25** (1/2), 37–41.
d. DUFRÉNOY, J. & DUFRÉNOY, M. L., 1950.—"François Bernier et la parasitologie." **25** (1/2), 111–112.

(5a) Buttner reproduces her previously published account [see No. 17a below] of progenesis of *Plagiorchis brumpti* in *Planorbis planorbis* and *Alytes obstetricans* tadpoles. This progenetic fluke is now illustrated by four text figures, and detailed measurements are given of forms 15 and 30 days old produced experimentally. R.T.L.

(5b) In a cytological and histochemical study of the trematode *Haplometra cylindracea* from the lungs of male frogs (*Rana temporaria*) caught in Nancy, Arvy deals in detail with the reactions of the host lung, the localization of haemoglobin and its derivatives in the parasite's body, and the cytology and histochemistry of the digestive tract of the parasite. Histochemical studies include the detection of haemoglobin, porphyrins, bile pigments, iron, lipoids, glycogen and ribonucleins. Arvy concludes that this trematode really feeds on the host's blood, having no haemoglobin derived from its own body, and that the ingested haemoglobin is catabolized in the lumen of the gut caeca. Iron metabolism is very peculiar in that all the iron is found to be involved in very stable organic combinations. The pulmonary reactions of parasitized frogs are seen to differ in certain respects from those of mammals infected with lung distomes. H.C.

(5c) Bevacqua & Wirth describe the development and surgical removal of a cyst from the orbital cavity of a woman of 54 years who had always lived in Italy. The cyst was 25 mm. long by 9 mm. broad. During removal an adult female nematode was freed from the cyst. It is identified as *Dirofilaria conjunctivae* (Addario, 1885) which is described. The principal measurements of the worms are: 131 mm. long, 500 μ broad, oesophagus 10 mm., anus 100 μ from tip of the tail, vulva 300 μ from anterior end. It is easily distinguishable from *Loa loa, Onchocerca volvulus* and *Filaria extraocularis* Skryabin, 1917. J.J.C.B.

6—Annals of Applied Biology.

a. FRANKLIN, M. T., 1950.—"Two species of *Aphelenchoides* associated with strawberry bud disease in Britain." 37 (1), 1–10.

b. STANILAND, L. N., 1950.—"Experiments on the control of chrysanthemum eelworm (*Aphelenchoides ritzema-bosi*, Schwartz) by hot water treatment." 37 (1), 11–18.

(6a) In examining strawberry plants showing symptoms of eelworm disease from different parts of Britain, Franklin has found both *Aphelenchoides fragariae* and *A. ritzema-bosi*. The chief characters distinguishing the two species are (i) the more slender body of *A. fragariae* which has a width of 14–15 μ and length/breadth ratio of about 50, as compared with a width of 20–21 μ and length/breadth ratio of about 40 in *A. ritzema-bosi*; (ii) the fairly gentle curve of the male tail in *A. fragariae* as compared with the sharp hook in *A. ritzema-bosi* when both are killed by gentle heat; (iii) the position of the excretory pore close to the nerve ring in *A. fragariae* while it is a short distance behind it in *A. ritzema-bosi*. Franklin considers that Ritzema-Bos' species *olesistus* is the same as his *fragariae* and she therefore discards the name *olesistus* as a synonym. Support for this is given by cross-inoculation experiments, in one of which *A. fragariae* from strawberries parasitized a fern and caused typical leaf-blotch symptoms on it, while in another a strawberry plant was successfully inoculated with nematodes originally diagnosed as *A. olesistus* from the diseased leaves of lilies. Successful cross-inoculations are also recorded with *A. ritzema-bosi* from strawberry to blackcurrant and with *A. ribes* from blackcurrant to strawberry, but no definite conclusions are drawn on this point. M.T.F.

(6b) After briefly reviewing published recommendations on hot-water treatment of chrysanthemums for the control of eelworm, Staniland describes a new technique for determining temperatures lethal to the eelworms *in vitro*. The eelworms are placed in water in a glass capillary U-tube which is immersed in a bath of hot water thermostatically controlled. After treatment the worms are transferred to watch glasses and observed at room temperature for four days: if they show no signs of activity they are gently warmed for short periods for a further two days. The time required to kill the worms was determined for temperatures from 109°F. to 126°F. In a preliminary trial chrysanthemums were treated at 110°F. for 30 minutes, 112°F. for twelve minutes, 115°F. for five minutes and 130°F. for one minute, and the stools plunged into cold water immediately after treatment. Better results were obtained at higher temperatures but some varieties were more susceptible to damage than others. Six difficult varieties (Enton Beauty, Incurved Sanctity, Balcombe Supreme, Loveliness, Lilac Loveliness and Empire White) and three amenable varieties (Rose Adonis, Golden Coralie and Gladys Paine) were then treated at 110°F. for 30 minutes, 115°F. for five minutes and 130°F. for one minute on 13th and 29th November, and planted out in boxes. Within a week it was obvious that the higher temperatures for a short period were better than the standard treatment. Observations made in the following February confirmed that treatment at 115°F. for five minutes and at 130°F. for one minute at the earlier date of treatment gave good results with all varieties, and it is recommended that the old standard treatment of 110°F. for 20–30 minutes be replaced by treatment at 115°F. for five minutes. M.T.F.

7—Annals of Tropical Medicine and Parasitology.

a. ALVES, W., 1950.—"The treatment of urinary bilharziasis with miracil D and nilodin." 44 (1), 34–41.

b. BERTRAM, D. S., 1950.—"Studies on the transmission of cotton rat filariasis. II.—Factors influencing the efficiency of the vector, *Liponyssus bacoti*; with a statistical analysis by P. Armitage." 44 (1), 55–83.

(7a) Differences in the cure-rates of Bilharzia infections, following the use of Miracil-D and of Nilodin (coated) tablets, which were formerly attributed to differences in the severity of the infections, are now considered to be due, partly at least, to the enteric

coating which reduces the effectiveness of Nilodin. In Southern Rhodesia a total course of 60 mg. per kg. body-weight of uncoated Miracil-D (Elberfeld) tablets given in six doses over three days has proved as effective as any orthodox course of antimony in curing urinary bilharziasis. Nilodin given in sugar-enteric-coated tablets was not as effective as uncoated Miracil-D (Elberfeld). Uncoated Nilodin gave excellent results, comparable with those obtained with Miracil-D. Miracil-D and Nilodin both gave rise to unpleasant side-effects which may render these drugs unacceptable in large-scale campaigns involving voluntary treatment. R.T.L.

(7b) An analysis has been made of the widely different infection rates obtained in experimental infections of different series of *Liponyssus bacoti* with *Litomosoides carinii* of the cotton-rat. It is shown that there is a definite association between the infection rate and the age of infection, and an independent association between infection rate and survival rate. No additional association with the host's blood count was observed, nor any additional influence on the infection rate, specific to an individual cotton-rat. R.T.L.

8—Australian Journal of Agricultural Research.

a. HAMILTON, F. J., 1950.—"A technique for the collection of nematodes from the alimentary tract of sheep." 1 (1), 93–98.
b. ROBERTS, F. H. S. & O'SULLIVAN, P. J., 1950.—"Methods for egg counts and larval cultures for strongyles infesting the gastro-intestinal tract of cattle." 1 (1), 99–102.

(8a) Hamilton illustrates and describes in detail a new apparatus for the recovery of gastro-intestinal nematodes from the alimentary tract of sheep. By this method large numbers of parasites can be recovered, free from ingesta and in good condition, more rapidly than by the older methods. Essentially the procedure consists of siphoning off the worms from a suspension of ingesta, after a preliminary screen, into jars containing sieves of varying mesh according to the species being dealt with at the time. For the recovery of *Trichostrongylus* spp. a specially designed separation beaker is used to facilitate the operation. It is usually necessary to repeat the process a second time to remove all foreign matter. J.W.G.L.

(8b) Roberts & O'Sullivan describe a modification of the Gordon-Whitlock technique for use in counting helminth eggs in low-plane infections of cattle. A four-cell egg-counting slide, similar to the Gordon-Whitlock slide, is used. This is 76 × 32 mm. with a roof of 76 × 20 mm. and the four cells each measure 20 × 10 × 2·5 mm. and hold 0·5 ml. The faeces are well stirred and a 3-gm. sample is weighed and placed in a 2-oz. wide-mouthed bottle ; 17 ml. of water are added and the faeces thoroughly emulsified. This mixture is poured into a strong bottle containing lead shot and 40 ml. of saturated brine are added. The bottle is then well shaken for 1–1½ minutes and a sample is taken by means of a piece of glass tubing 4–5 mm. in diameter attached to a large rubber bulb. Each chamber of the slide is filled after fresh shaking. All four cells are counted under a 5× or 7× eye-piece and 1-in. objective. The total number of eggs obtained, multiplied by 10, gives the number of eggs per gramme. Small amounts of faeces can be preserved for egg counting by mixing 0·5% phenothiazine with the sample. For the identification of infections which cannot be easily differentiated by the eggs, diagnosis is based on the larvae developed in a faecal culture. Dried pads of cattle dung are collected, roughly broken up and dried in the sun for two or more days, exposed to 140°C. for three to four hours and passed through a meat mincer ; 30–40 gm. are hand-mixed in a bowl with sufficient dried sterile cattle faeces to produce a mixture which is moist and crumbly. This is transferred to a large jar to a depth of 2–2½ in. The cap is left loose and the culture is kept at 26°–28°C. for eight days. The cap is then screwed tight and the jar is left in diffused light for half-an-hour. Those larvae which have migrated up the sides are washed off. The jar is filled completely with water and inverted over a petri dish, which is half filled with water and left overnight. The larvae are then found in the petri dish. J.W.G.L

9—Australian Veterinary Journal.

a. GORDON, H. McL., 1950.—"Some aspects of parasitic gastro-enteritis of sheep." **26** (2), 14–28; (3), 46–52; (4), 65–72; (5), 93–98.
b. SUTHERLAND, A. K., O'SULLIVAN, P. J. & OHMAN, A. F. S., 1950.—"Helminthiasis in an elephant." **26** (4), 88–90.

(9a) That parasitic gastro-enteritis in sheep may be produced by the presence of several different species in different proportions, with different rates of egg production and different locations in the gut, may account for anomalies in assessing the efficiency of anthelmintics. The biotic potential of these parasites varies from species to species. Their free-living stages respond differently to climatic conditions. The adult parasites respond differently to anthelmintics. These differences render the term "parasitic gastro-enteritis", if loosely used, meaningless and misleading. In Australia *Haemonchus contortus* and *Oesophagostomum columbianum* are the most important intestinal parasites in regions with predominantly summer rainfall, and *Trichostrongylus* spp. in those with good winter rains and more than 20 inches of rainfall in the year. Although *H. contortus* is most readily killed by phenothiazine the resistance of the immature forms and its high biotic potential may offset any reduction in worm burden. Repeated treatments with anthelmintics containing copper may play a greater part in preventing unthriftiness than the more effective phenothiazine. The significance of egg-counts may be obscured by variations in the rate of egg production caused by fasting, by large worm burden and by the inhibitory effect of small doses of phenothiazine. The importance, pathogenic effects and symptoms, seasonal occurrence, significant egg-counts and pathogenic numbers of trichostrongyles and oesophagostomes are discussed. Comparatively little work has been done hitherto on the pathogenic significance of *Ostertagia* spp., *Chabertia ovina* and *Nematodirus* spp., and on the efficiency of their treatment with phenothiazine. The other helminth parasites of the alimentary canal of sheep are briefly mentioned as they seldom attain levels of infection which give rise to pathogenic effects in Australia. The extent and significance of parasitic gastro-enteritis in sheep in Australia is examined, with comments on the number of sheep involved and the nature and range of losses which may occur. The role of sub-clinical helminthiasis in unthriftiness is stressed. The complex relationships of parasitic infections and the variations in their intensity from year to year combine to necessitate continuous control measures based on epidemiological information. The direct and indirect effects of nutrition on resistance are noted and some observations and experiments are described. Some information is given on the cost of treatment, chiefly on costs of anthelmintics; the cost of an "epidemiological" plan of treatment is given. The influence of the complicated ruminant stomach and the oesophageal groove reflex on anthelmintic efficiency is stressed, as a preliminary to comments on methods of testing anthelmintics. The uses and efficiency of copper sulphate, copper sulphate and arsenic mixture, copper and nicotine sulphate mixture, tetrachlorethylene, carbon tetrachloride, and phenothiazine are discussed with emphasis on preventive use. The multiple purposes and seasonal timing of anthelmintic treatment are outlined for summer-rainfall regions in which haemonchosis, trichostrongylosis and oesophagostomiasis are prevalent. The times of occurrence and indications for "tactical" treatment, based largely on rainfall, are given for the years 1944 to 1947 at the Regional Pastoral Laboratory, Armidale, N.S.W. Results of trials of anthelmintics under outbreak conditions are presented, to place the value of anthelmintics in proper perspective. In one such outbreak, with the exception of phenothiazine and carbon tetrachloride the drugs tested had little effect on egg output. The reasons for the general failure of anthelmintics in outbreaks are stated to be low efficiency against immature worms, lack of "preventive" (very high) efficiency, complete failure in some sheep of anthelmintics dependent on the oesophageal groove reflex, and rapid reinfection from contaminated pastures. Routine treatment is recommended, rather than delay until a definite diagnosis has been made, in order to prevent ill-effects in the sheep and increased pasture contamination. Long-term plans are necessary in some cases, notably *Oesophagostomum columbianum* infection. The contribution of knowledge

of resistance phenomena to the development of control measures is discussed. The special case of "self-cure" is discussed further, and doubt is cast on Gordon's previous hypothesis that "self-cure" in the field may be due to something "anti-helminthic" in fresh green grass. Studies in collaboration with Stewart [unpublished] have shown that "self-cure" may be produced in a high proportion of infected sheep by administration of a large dose of infective larvae, and may be accompanied by changes in the titre of circulating antibody and eosinophils. R.T.L.

(9b) A 14-year-old Indian elephant imported from Singapore died in quarantine at Brisbane. Post-mortem examination showed an extremely heavy infection with the hookworm *Bathmostomum sangeri*, which was undoubtedly responsible for the symptoms (anaemia, anasarca and emaciation) and death. In the stomach there was a large diffuse abscess resembling the lesions caused by *Draschia* [=*Habronema*] *megastoma* in the horse ; large numbers of *Parabronema indicum* were found in the lesion. Other helminths present were *Strongylus* (*Decrusia*) *additictus, Equinurbia sipunculiformis, Amira pileata, Murshidia murshida* and *Grammocephalus varedatus.* H.McL.G.

10—Berliner und Münchener Tierärztliche Wochenschrift.

a. SCHULTE, F., 1950.—"*Echinococcus alveolaris* in der Leber eines Sumpfbibers." Year 1950, No. 2, pp. 29–30.

(10a) A hydatid of the alveolar or multilocular type was found in the liver of a swamp beaver [*Myocastor coypus*] from a farm near Stuttgart. The interest of the case lies in its occurrence in southern Germany, where alveolar hydatid in man is of relatively common occurrence. The cyst and the lesion are described. E.M.S.

11—British Medical Journal.

a. MURPHY, F. D. & PASCALL, K. G., 1950.—"Liver fluke in the common bile duct." Year 1950, 1 (4654), 647.
b. DAVIES, E. R. & STEWART, I. S., 1950.—"Vesical carcinoma with Bilharzia." Year 1950, 1 (4662), 1114–1115.
c. CAMERON, I. G. & VAN SOMEREN, G. R. C., 1950.—"*Schistosoma mansoni* infection." Year 1950, 1 (4662), 1117.

(11c) Two cases of *Schistosoma mansoni* in children in Kenya which had resisted antimony therapy, received enteric-coated preparations of Miracil-D in the dosage of 27 mgm. per kg. body-weight for three days. Weekly examinations of faeces for several months thereafter were negative for schistosome eggs. Cercarial antigen tests which previously had been positive became negative two months after treatment. R.T.L.

12—California Fish and Game.

a. HERMAN, C. M. & KRAMER, R., 1950.—"Control of gapeworm infection in game farm birds." 36 (1), 13–17.

(12a) Herman & Kramer believe that gapeworm infection can be controlled on game farms by sterilizing the soil with either D-D or ethylene dibromide. The soil of pheasant breeding-pens known to be heavily contaminated with *Syngamus* was treated in the autumn of 1947. Breeding birds were put into the pens in February 1948 and all the birds remained free of infection until they were released in July. Control pens which were not treated and experimental pens treated either mechanically or by spraying with formalin retained their infestations. Care should be taken to ensure that fresh contamination is not introduced by attendants and utensils : this apparently happened in some of the experimental pens. P.A.C.

13—Canadian Journal of Comparative Medicine.

a. CHOQUETTE, L. P. E. & GÉLINAS, L. DE G., 1950.—"The incidence of intestinal nematodes and protozoa in dogs in the Montreal district." 14 (2), 33–38. [French summary p. 37.]
b. SWALES, W. E., 1950.—"Enterohepatitis (blackhead) in turkeys V. Further experiments on chemotherapy." 14 (3), 118–125.
c. HUTSON, L. R., 1950.—"A list of some parasites recovered from livestock in Barbados, B.W.I." 14 (3), 139.

(13a) Choquette & Gélinas, using the centrifugal flotation method of examining faeces, found nematodes in 79 out of 155 dogs in the Montreal area. Their finding of *Strongyloides* eggs is the first record of this parasite in dogs in Canada. J.W.G.L.

(13b) Swales confirms Waletzky's preliminary conclusion that 2-amino-5-nitrothiazole ("Enheptin-T") was very effective in protecting turkeys from experimental blackhead when treatment was delayed for 120 hours after oral administration of *Heterakis gallinae* eggs. The drug has a histomonicidal as well as an anti-Heterakis action. Twenty-one other chemicals were also tested and the results are tabulated. R.T.L.

(13c) The helminth species found by Hutson in domesticated animals in Barbados were: *Oxyuris equi, Habronema muscae, Strongylus vulgaris, S. equinus, Setaria equina* and *Parascaris equorum* in horse; *Trichuris ovis* (moderate), *Oesophagostomum venulosum* (very heavy), *Haemonchus contortus* (heavy) and *Moniezia expansa* (rare) in sheep; *O. venulosum* and *H. contortus* in goat; *Arduenna strongylina* (heavy), *Metastrongylus elongatus* (fairly heavy), *Oesophagostomum* sp. (light), *Stephanurus dentatus* (rare) and *Ascaris lumbricoides* (heavy) in pigs; *Dictyocaulus viviparus* (heavy) in cattle; *Ancylostoma caninum* and *Toxocara canis* in dogs; *Raillietina echinobothrida, Oxyspirura mansoni, Ascaridia galli, Tetrameres americana* and *Capillaria annulata* in poultry. The majority of the helminths were identified by Professor T. W. M. Cameron. R.T.L.

14—Canadian Medical Association Journal.

a. MILLER, M. J. & CHOQUETTE, L. P. E., 1950.—"Studies in pinworm infections. IV. Tests with p-benzylphenyl carbamate in the treatment of pinworm infections." 62 (3), 271–274. [French summary p. 274.]

(14a) *p*-Benzylphenyl carbamate ("oxylan", "diphenan") exhibited anthelmintic properties against *Enterobius vermicularis* and gave no untoward symptoms. But the percentage of complete cures effected by the daily administration of 1·5 gm. or of 2·0 gm. for seven days, repeated after a treatment-free interval of seven days, was not large enough to justify its recommendation as a treatment until further trials with increased dosages have been made. R.T.L.

15—Ceylon Journal of Medical Science.

a. SIVALINGAM, V., [1950].—"Some Ceylon fresh water snails and human schistosomes." Year 1949, 6 (4), 184–185.

(15a) Many East African soldiers stationed in Ceylon during World War II were found to be infected with *Schistosoma haematobium* and *S. mansoni* and were considered a potential danger to the indigenous population in localities where there are large water tanks. Sivalingam therefore subjected 70 fresh-water snails collected from the tanks, and comprising the species *Indoplanorbis exustus, Melanoides* (*Plotia*) *scabra* and *Melanoides* (*M.*) *tuberculatus*, to schistosome-positive urine and faeces from these men, but obtained entirely negative results. The species *Viviparus ceylonicus* and *Pila dolioides*, also tank-dwelling, were not subjected to infection as they did not live long enough under laboratory conditions. H.C.

16—Chronicle of the World Health Organization.

a. ANON., 1950.—"Bilharziasis." 4 (1), 26–29.

(16a) The Joint OIHP/WHO Study-Group on African schistosomiasis (bilharziasis) at its first meeting in Cairo in October 1949 stressed that this disease "is a public-health problem second only to malaria" and emphasized the danger from the introduction of irrigation schemes in certain areas. No irrigation scheme should be undertaken without the prior approval of the public health authorities. The adoption of uniform methods of diagnosis and survey is suggested. No measures for control will be really effective without education of the public. Propaganda, which should begin in the schools, should aim at changing habits and customs, especially in relation to pollution of streams. The priority of *Bilharzia* and bilharziasis over *Schistosoma* and schistosomiasis was supported by the meeting. R.T.L.

17—Comptes Rendus des Séances de l'Académie des Sciences. Paris.

a. BUTTNER, A., 1950.—"Première démonstration expérimentale d'un cycle abrégé chez les trématodes digénétiques (*Plagiorchis brumpti* n.sp.)." 230 (2), 235–236.

(17a) At the Richelieu Experimental Station, Buttner obtained from *Planorbis planorbis*, xiphidiocercariae of large size which encysted in the tadpoles of *Alytes obstetricans*. In 15 days 50% of the metacercariae were progenetic. In 30 days all contained embryonated eggs. With these eggs, she then experimentally infected 30% of *P. planorbis* although only one in 150 wild *P. planorbis* showed a natural infection. The excysted metacercaria is identified as *Plagiorchis brumpti* n.sp. Buttner is of the opinion that this fluke develops normally without a definitive host. It is possible that the eggs are liberated by the death of the infected tadpoles and are then eaten by the molluscs (which readily consume chopped-up fragments of tadpoles), or pass undamaged through the gut of some vertebrate. R.T.L.

18—Indian Veterinary Journal.

a. SEN, M. R., 1950.—"Acute fasciolasis amongst cattle complicated with *Theileria mutans*." 26 (4), 305–309.
b. D'SOUZA, B. A., 1950.—"Canine micro-filariasis—some clinical aspects (recorded at the Madras Veterinary College Small Animal Clinic)." 26 (5), 414–419.

(18b) Case histories are given of four Indian dogs with varying symptoms and with filarial embryos in the peripheral blood. In one case the intramuscular injection of anthiomaline over a period of two weeks gave spectacular results. R.T.L.

19—Journal of the American Veterinary Medical Association.

a. GARDINER, M. R., 1950.—"Canine filariasis in North Queensland." 116 (874), 52.
b. KOUTZ, F. R., 1950.—"The liver fluke (*Amphimerus pseudofelineus*) from a cat in Ohio." 116 (875), 127.
c. ZIEGLER, C. G., 1950.—"Treatment of canine filariasis with caricide, diethylcarbamazine." 116 (876), 209–210.
d. MISENER, A. G. & STANTON, H. M., 1950.—"Strongyloidiasis in the dog." 116 (876), 216.
e. LEVINE, N. D., MILLER, L. J., MORRILL, C. C. & MANSFIELD, M. E., 1950.—"Nematode dermatitis in cattle associated with Rhabditis." 116 (877), 294–296.
f. ARMISTEAD, W. W., 1950.—"Heartworm in dogs." 116 (877), 297.
g. MARSH, H., 1950.—"Cattle and sheep diseases in Australia." 116 (877), 298–299.
h. KARTSONIS, P. L. & AUSTIN, J. A., 1950.—"Anthelin—a new compound for removing tapeworms and roundworms from dogs." 116 (877), 301–303.
i. SUSSMAN, O. & PRCHAL, C. J., 1950.—"*Taenia saginata* in man and cattle in Arizona." 116 (878), 365–366.
j. MEYER, M. C. & WITTER, J. F., 1950.—"The giant kidney worm (*Dioctophyma renale*) in mink in Maine, with a summary of recent North American records." 116 (878), 367–369.

(19a) A case of canine filariasis is reported from North Queensland where *Dirofilaria immitis* infection is common. There were masses of immature worms from 2–3 inches

long in the small peripheral pulmonary arteries. No microfilariae were noticed in the blood. R.T.L.

(19b) *Amphimerus pseudofelineus* is reported from a cat. This is the first record of its occurrence in Ohio. There were two *Paragonimus westermanii*, two *Ancylostoma caninum* and one *Dipylidium caninum* in the same animal. R.T.L.

(19c) Ziegler reports favourably on the results of treatment of seven dogs with caricide [=hetrazan] for infections with *Dirofilaria immitis*. Clinical cures were observed in every case, with the disappearance of microfilariae from the blood in six of seven dogs examined subsequently. Three dogs, examined 3–4 months after treatment, were still negative. I.J.C.B.

(19d) A dog with Strongyloides infection was successively treated with N-butyl chloride, hexylresorcinol and tetrachlorethylene. Treatment with $\frac{1}{2}$-grain enteric-coated tablets of gentian violet, two tablets three times daily, resulted in temporary improvement and disappearance of larvae from the faeces, but after five days the condition relapsed and larvae were again seen. When a gelatin capsule containing phenothiazine was given orally each day for three days the larvae disappeared and there was no recurrence. R.T.L.

(19e) Dermatitis associated with larval and adult *Rhabditis strongyloides* is reported in three cows in Central Illinois. The skin was thickened, dry and scurfy, coarsely wrinkled and depilated. There were numerous pustules 1–10 mm. in diameter containing the nematodes. Recovery was spontaneous without treatment. R.T.L.

(19f) The number of microfilariae in a blood film and the presence of emaciation are not good indications of the severity of *Dirofilaria immitis* infection in the dog. More reliable are ascites especially of the limbs, moist skin lesions, epistaxis, haematuria and posterior paralysis. R.T.L.

(19g) Marsh compares the incidence of diseases of cattle and sheep in Australia with those in the U.S.A. *Fasciola hepatica* occurs in the high rainfall areas in both countries. Intestinal parasitism is much the same. In Australia phenothiazine is usually administered instead of being fed, as the practice of feeding salt is disappearing there. R.T.L.

(19h) A new synthetic anthelmintic, N-methyl-tetrahydro-methyl nicotinate-*p*-carboxyphenyl stibonic acid, termed "anthelin", in a dose of 4·69 mg. per lb. body-weight removed 697 out of 719 *Dipylidium caninum* and *Taenia* sp. (i.e. 97%) and 21 out of 23 *Toxocara canis* and *Toxascaris leonina* (i.e. 91%) from 10 dogs. There was good tolerance to the administration of double this amount on three consecutive days. R.T.L.

(19i) In cattle fattened in feedlots in the Salt River Valley of Arizona the rate of infection with *Cysticercus bovis* reached 3% in 1947. In one herd the rate attained 12%. The source of infection was found to be chiefly in those fields in which marketable vegetable crops had been grown : the ground was contaminated with the faeces of workers employed in picking and for whom adequate sanitary provision had not been made. Of 272 human faecal samples examined, four were positive for *Taenia saginata*. R.T.L.

(19j) Two fatal cases of infection with *Dioctophyme renale* are reported in ranch-raised mink at Whitney, Maine, and one in a dog at Lexington, Kentucky. Published records of the occurrence of this parasite in North America since 1934 are summarized. R.T.L.

20—Journal of the Kansas Medical Society.

a. TATE, W. M. & WHEELER, J. A., 1950.—" Trichinosis : with report of a case." 51 (1), 11–15.

(20a) Tate & Wheeler believe that the incidence of Trichinella infection would approximate 16·4% if a careful search were made at all routine autopsies in the U.S.A. A case of severe trichinelliasis in which the acute stage lasted 31 days is reported. Penicillin had no effect on its course, but 1·0 gm. of streptomycin given on the 15th day of illness reduced the temperature permanently to normal. R.T.L.

21—Journal of Parasitology.

a. YOUNG, R. T., 1950.—" Cestodes of California gulls." 36 (1), 9–12.
b. LUND, E. E., 1950.—" A survey of intestinal parasites in domestic rabbits in six counties in southern California." 36 (1), 13–19.
c. CHIN, T. H., 1950.—" Two new species of helminths from the cormorant, *Phalacrocorax auritus*." 36 (1), 20–24.
d. CRUSZ, H. & SIVALINGAM, V., 1950.—" A note on the occurrence of *Gongylonema pulchrum* Molin, 1857, in man in Ceylon." 36 (1), 25–26.
e. RIEDEL, B. B., 1950.—" Further studies of the effect of age of mice upon adult *Trichinella spiralis*." 36 (1), 27–28.
f. READ, C. P., 1950.—" The acquisition of isotopically labeled inorganic phosphate by the tapeworm, *Hymenolepis diminuta*, with some remarks on the host-parasite relationship." 36 (1), 34–40.

(21a) Young describes *Hymenolepis californicus* n.sp. from *Larus californicus* and *L. delawarensis*. It has ten hooks on the scolex measuring 0·016 mm. There is a large cirrus-sac, and the linear testes lie dorsal to the female genitalia. He gives a further description of *Tetrabothrius lari* and makes some remarks on two species of *Paricterotaenia*. P.A.C.

(21b) Coccidia are by far the most frequent and most important parasites occurring in rabbits raised in hutches, but certain helminths also occur. Lund found eggs of *Passalurus ambiguus* several times in faecal specimens, and a single case of eggs of *Obeliscoides cuniculi*. P.A.C.

(21c) Chin describes two new helminth parasites from *Phalacrocorax auritus* from Illinois. *Opisthorchis vitellatus* n.sp. from the bile ducts is an elongated worm with large oral sucker, the uninterrupted vitellaria stretching from the acetabulum to the anterior testis, and very large round testes. *O. tsingkiangpuensis* is made a synonym of *O. anatis*, which is transferred to the genus *Amphimerus*. *Syngamus hexadontus* n.sp. is large with a pointed tail and six triangular teeth. The eggs are undeveloped when passed. P.A.C.

(21d) Crusz & Sivalingam give a brief description, illustrated by photomicrographs, of an immature female *Gongylonema pulchrum* from the buccal mucosa, near the left lower jaw, of a 32-year-old man in Colombo. Although this is the fourteenth recorded case of human infection with this species, it is the first to be reported from India, Ceylon or the Far East. H.C.

(21e) That there is no age resistance in mice to adult *Trichinella spiralis* is not confirmed. Age has no eliminative influence before the larvae reach maturity, but when the period of parasitism was prolonged to 15 days, or beyond that required for larval maturity, elimination was greater in older mice. R.T.L.

(21f) Read describes experiments relating to the gross uptake, *in vivo*, of isotopically labelled inorganic phosphate (P^{32}) by *Hymenolepis diminuta*. When trace doses of labelled phosphate were given by stomach tube to starved host rats the maximum activity of host gut mucosa, as estimated by the special technique described, was reached in about 70 minutes while that in the worm tissues was reached in 85–90 minutes. When glucose was given with the trace dose of phosphate, the maximum mucosal activity was attained

21—Journal of Parasitology (cont.)

g. COIL, W. H., 1950.—"The genus *Ophiovalipora* Hsü, 1935, (Cestoda: Dilepididae) with the description of *Ophiovalipora minuta* sp.nov. from the green heron (*Butorides virescens* L.)." **36** (1), 55–61.
h. WILLEY, C. H. & KOULISH, S., 1950.—"Development of germ cells in the adult stage of the digenetic trematode, *Gorgoderina attenuata* Stafford, 1902." **36** (1), 67–79.
i. REISH, D. J., 1950.—"New host and distribution records for two trematodes from the Western gull." **36** (1), 84.
j. OGREN, R. E., 1950.—"Occurrence of *Diplotriaena thomasi* Seibert in the slate-colored junco." **36** (1), 85.
k. JONES, A. W. & WARD, H. L., 1950.—"The chromosomes of *Macracanthorhynchus hirudinaceus* (Pallas)." **36** (1), 86.
l. CHANDLER, A. C., 1950.—"*Gongylonema pulchrum* in the black bear, *Euarctos americanus*, and the probable synonymy of *G. pulchrum* Molin, 1857, with *G. ursi* (Rudolphi, 1819)." **36** (1), 86–87.
m. CHANDLER, A. C., 1950.—"*Trichostrongylus calcaratus* in muskrat." **36** (1), 87.
n. OGREN, R. E., 1950.—"Morphological observations on the onchosphere of *Mesocestoides*." **36** (1), 87.
o. FISCHTHAL, J. H., 1950.—"Additional hosts and geographical distribution records for the common fish acanthocephalan, *Leptorhynchoides thecatus*." **36** (1), 88.

in about 90 minutes while activity in the worms increased only very slowly with time. A similar slow increase in P^{32} content was shown by worms when trace doses of labelled phosphate were parenterally administered to rats either before or after the administration of glucose. Read concludes from this that when the host is absorbing glucose the trace amounts of phosphate fail to reach the worms. In contrast to this, the uptake of radio-active phosphorus by worms in hosts given macro-amounts (5 mgm.) of labelled sodium phosphate by stomach tube was found to be very similar whether glucose was given or not. Read suggests that this constitutes some evidence for an enhancement by glucose of mucosal phosphate absorption. As to the actual mechanism of enhancement, it is probably associated with the phosphorylation of carbohydrate in the intestinal mucosa. H.C.

(21g) Coil describes *Ophiovalipora minuta* n.sp. from *Butorides virescens* in Indiana. It is a small cestode with usually 8–9 testes in each segment. There is a thin-walled vagina. The genus is reviewed. P.A.C.

(21h) The development of male and female gametes has been traced from primordial germ cells to maturity in *Gorgoderina attenuata*. There are 14 diploid chromosomes. Seven chromosomes appear in each of the mature gametes. The relation between cyto-plasmic structures of oöcytes and vitelline cells, and the nutrition of the egg and formation of the shell have been studied and correlated with these processes in other species. R.T.L.

(21i) The presence of *Parorchis acanthus* and *Gymnophallus deliciosus* in *Larus occidentalis* killed at Newport, Oregon, extends their host and geographical distribution. R.T.L.

(21j) *Junco hyemalis* is reported as a new host of *Diplotriaena thomasi*. R.T.L.

(21l) A *Gongylonema* similar in all respects to *G. pulchrum* was found in the tongue of a black bear *Euarctos a. americanus* from White Deer Valley, Lycoming County, Pa. As it is probable that *G. pulchrum* will fall as a synonym of *G. ursi* when the type specimens of *G. ursi* in the Vienna Museum are re-examined, details are given of measurements of this American material. R.T.L.

(21m) *Trichostrongylus calcaratus* is now reported from *Ondatra zibethica*. Chandler considers that *T. fiberius* is a synonym. R.T.L.

(21 o) To Lincicome & Van Cleave's 1949 geographical and host lists of *Leptorhynchoides thecatus*, seven additional fishes as hosts are added from north-west Wisconsin, five with mature worms and four with encysted forms. R.T.L.

21—Journal of Parasitology (cont.)

p. GOLDMAN, M. & JOHNSON, S. A., 1950.—"Deep-freeze preservation of stool specimens containing intestinal parasites." **36** (1), 88.
q. LINDQUIST, W. D., 1950.—"Attempts to adapt *Nippostrongylus muris* to the cotton rat." **36** (1), 88–89.
r. PARKER, M. V., 1950.—"*Euryhelmis squamala* (Rudolphi), 1819 reported from a racoon." **36** (1), 89.
s. SADUN, E. H., 1950.—"Trichiniasis in Arkansas." **36** (1), 89–90.
t. CHANDLER, A. C., 1950.—"*Mesostephanus longisaccus*, a new cyathocotylid trematode from a dog." **36** (1), 90.
u. READ, C. P., 1950.—"A new host for *Capillaria caudinflata* (Molin, 1858)." **36** (1), 91.
v. CAMERON, T. W. M., 1950.—"Sir William Osler and parasitology." [Presidential Address to the American Society of Parasitologists.] **36** (2), 93–102.
w. BERN, H. A. & HANSEN, M. F., 1950.—"Parasitic infections among natives of the North Markham area, New Guinea." **36** (2), 103–106.
x. CHU, H. J., 1950.—"*Bucephalopsis kweiyangensis* n.sp. from the giant salamander, *Megalobatrachus japonicus* Temm. in Kweichow, China." **36** (2), 120–122.

(21p) Deep freezing of faeces has not been found to be a satisfactory method for preserving helminth eggs for demonstration by direct examination or by zinc sulphate and brine flotation techniques. **R.T.L.**

(21q) *Nippostrongylus muris* does not easily adapt itself to the cotton-rat in three generations. **R.T.L.**

(21r) *Euryhelmis squamula* has been found in *Procyon lotor* from Durham Co., N.C. This is the first notice of this species in North America. **R.T.L.**

(21s) Of intradermal tests on 155 medical students and technologists residing in Arkansas, two were positive. Both of the subjects resided in Little Rock. Neither had a history of clinical symptoms suggesting Trichinella infection. Twenty-seven unselected autopsies at the University Hospital gave one positive diaphragm. The diaphragms of 200 pigs slaughtered at Little Rock were negative. **R.T.L.**

(21t) *Mesostephanus longisaccus* n.sp., found in the small intestine of a dog at Houston, Texas, is considered to be an accidental infection as most species of this genus live in fish-eating birds. The specimens lacked a ventral sucker, but a highly developed cirrus pouch was present. **R.T.L.**

(21u) *Capillaria caudinflata* is reported for the first time from *Turdus migratorius*. It is suggested that this host may be the means by which *C. caudinflata* is introduced into uninfected flocks of domesticated birds. **R.T.L.**

(21w) A survey of helminth infections among the natives in the North Markham area of New Guinea, which has been suggested as a possible site for agricultural settlement, shows that hookworm is a serious problem in that area. Of 463 natives examined, 80% had hookworm, 10% had *Trichuris trichiura*, 4% had *Ascaris lumbricoides*, and 3% had *Strongyloides stercoralis*. In 184 labourers the nocturnal incidence of *Wuchereria bancrofti* was 30% and the diurnal incidence 2·2%. *Aëdes* (*Stegomyia*) *scutellaris* and *Culex* (*Culex*) *annulirostris* were widely distributed in the Nadzab area, while *Mansonia* (*Mansonioides*) *uniformis* occurred only in swampy areas along streams draining into the Markham River. **R.T.L.**

(21x) *Bucephalopsis kweiyangensis* n.sp. from the giant salamander *Megalobatrachus japonicus* is the first adult gasterostome to be recorded from China. It is distinguished from other members of the genus by the location of the testes side by side, the long cirrus, the long atrium and its amphibian host. **R.T.L.**

21—Journal of Parasitology (cont.)

y. BYRD, E. E., 1950.—"The excretory system in Trematoda. II. The excretory system of *Loxogenoides bicolor* (Krull, 1933)." **36** (2), 139–144.
z. CORT, W. W., AMEEL, D. J. & VAN DER WOUDE, A., 1950.—"The germinal mass in the rediae of *Triganodistomum mutabile* (Cort) (Trematoda : Lissorchiidae)." **36** (2), 145–151.
ba. JACHOWSKI, Jr., L. A. & STIREWALT, M. A., 1950.—"Toxicities of some organic chemicals to *Australorbis glabratus*, a snail vector of *Schistosoma mansoni*." **36** (2), 152–154.
bb. KNISKERN, V. B., 1950.—"*Rhipidocotyle septpapillata* Krull, 1934 (Trematoda) ; the cercaria and notes on the life history." **36** (2), 155–156.
bc. CORT, W. W., AMEEL, D. J. & VAN DER WOUDE, A., 1950.—"Germinal material in the rediae of *Clinostomum marginatum* (Rudolphi)." **36** (2), 157–163.
bd. HUNTER, III, G. W. & WARREN, V. G., 1950.—"Studies on filariasis VI. Observations of the reversal of microfilarial periodicity in a case of filariasis bancrofti." **36** (2), 164–168.
be. VAN CLEAVE, H. J. & HADERLIE, E. C., 1950.—"A new species of the acanthocephalan genus *Octospinifer* from California." **36** (2), 169–173.

(21y) The excretory system of *Loxogenoides bicolor* from *Rana catesbeiana* in Georgia consists of 12 groups of flame cells, with three in each group, the formula being 2[(3+3+3) + (3+3+3)]. Byrd discusses the confusion which at present exists in the species assigned to the family Lecithodendriidae. R.T.L.

(21z) In *Triganodistomum mutabile* the mother and daughter rediae have unusually large and complex germinal masses. The tailless cercariae have well developed adult structures. Although only a few are present in each redia, the large number of daughter rediae and the persistence of the large germinal masses provide for large numbers of individuals. The large germinal masses attached to the posterior end of the rediae add to the evidence that the Lissorchiidae are related to the Plagiorchioidea. Although *T. mutabile* closely resembles *Lissorchis fairporti*, the larval stages described for them are so different that it is probable that the xiphidiocercaria assigned by Magath to *L. fairporti* does not belong to this species. R.T.L.

(21ba) Of 20 organic compounds tested against *Australorbis glabratus* for molluscicidal activity, 20 were ineffective in 0·01 M dilutions. Of unchlorinated acids and their derivatives, oxalic acid was the most toxic, all snails being killed within 24 hours in a 0·004 M solution. Of amines tested, ethylenediamine was most toxic with a minimum lethal concentration of 0·005 M. Of the chlorinated compounds tested, methyl and ethyl chloracetates and chloracetamide were the most toxic. Ethyl chloracetate, chloracetonitrile and chloracetamide were markedly more toxic than the corresponding unchlorinated compounds. The minimum lethal concentration of ethyl chloracetate (0·0001 M) approached that of copper sulphate, while dinitro-*o*-cyclohexylphenol killed at a concentration of 2 p.p.m. (0·000008 M) according to Stirewalt & Kuntz (1947). R.T.L.

(21bb) *Cercaria basi* is shown to be the larval stage of *Rhipidocotyle septpapillata*. It develops in *Lampsilis siliquoidea*, encysts in various small fishes and attains maturity in the sunfish *Lepomis gibbosus*. R.T.L.

(21bc) The germinal material in the redia of *Clinostomum marginatum* is organized in small groups of 2–5 cells which are free in the body-cavity. In very small rediae, the germinal cell groups only may be present. In older rediae, developing embryos also occur and must divide very rapidly to produce the large number of embryos which develop in the rediae. They are probably the prototypes of the complex floating germinal masses found in the strigeids. *C. marginatum* is related to the schistosomes and the strigeids in which the secondary germinal cells are daughter sporocysts. The mechanism of reproduction in the rediae of *C. marginatum* differs from those so far studied in Fasciolatoidea and the families Hemiuridae, Lissorchiidae, Allocreadiidae, Heterophyidae and Troglotrematidae. R.T.L.

(21bd) Reversal of periodicity associated with a change in the waking and sleeping habits was observed in a man who had acquired filariasis in British Guiana and whose microfilarial count was normally nocturnal. Counts were made every two hours for a period of 26 hours and this was repeated ten times during 14 months. Periodicity was nocturnal when sleeping and waking habits were normal. When the sleeping hours were altered nocturnal periodicity was reversed. When the patient slept for four hours during the day and for four hours at night the microfilarial curve lay between the others. R.T.L.

(21be) *Octospinifer torosus* n.sp. heavily infects *Catostomus occidentalis* in Clear Lake, California. It differs from *O. macilentus* in possessing a larger proboscis and somewhat larger proboscis hooks. The genital region in females of the two species is markedly different. R.T.L.

22—Journal of the Washington Academy of Sciences.

a. VAN CLEAVE, H. J. & BANGHAM, R. V., 1950.—"Four new species of the acanthocephalan family Neoechinorhynchidae from fresh-water fishes of North America, one representing a new genus." Year 1949, 39 (12), 398–409.

(22a) Four new species of Neoechinorhynchidae are described from North American fresh-water fishes, namely *Paulisentis fractus* n.g., n.sp. and *Neoechinorhynchus saginatus* n.sp. from *Semotilus a. atromaculatus*, *N. tumidus* n.sp. from *Leucichthys artedi* and *Coregonus clupeaformis*, and *N. doryphorus* n.sp. from *Jordanella floridae*. The new genus *Paulisentis* has a small shortly cylindrical proboscis with relatively weak hooks arranged as six diagonal rows of five hooks each. The body wall is relatively thick and the musculature of the male bursa is poorly developed. R.T.L.

23—Lancet.

a. MALHOTRA, S. L., 1950.—"Filaria and Loeffler's syndrome." [Correspondence.] Year 1950, 1 (6596), 181-182

b. BALL, J. D., 1950.—"Filaria and Loeffler's syndrome." [Correspondence.] Year 1950, 1 (6600), 372.

24—Mycologia.

a. DRECHSLER, C., 1950.—"Several species of *Dactylella* and *Dactylaria* that capture free-living nematodes." 42 (1), 1–79.

(24a) Drechsler describes and figures six new species of nematode-capturing fungi, namely *Dactylella stenobrocha* n.sp., *Dactylella aphrobrocha* n.sp, *Dactylella cionopaga* n.sp., and *Dactylaria eudermata* n.sp., *Dactylaria haptotyla* n.sp., *Dactylaria sclerohypha* n.sp. He adds a note on the relationships of *Gonatobotrys simplex* Corda to the predacious hyphomycetes. J.B.G.

25—Nature. London.

a. ONABAMIRO, S. D., 1950.—"A technique for studying infection of *Dracunculus* in *Cyclops*." [Correspondence.] 165 (4184), 31.

b. JONES, F. G. W., 1950.—"A new species of root eelworm attacking carrots." [Correspondence.] 165 (4185), 81.

c. LEECH, F. B., 1950.—"Statistical analysis of results for successive tests on the same organism." [Correspondence.] 165 (4191), 323–324.

d. SMYTH, J. D., 1950.—"Parthenogenetic development of eggs from a cestode cultured aseptically *in vitro*." [Correspondence.] 165 (4195), 492–493.

e. GOODEY, J. B., 1950.—"Potato tuber eelworm and iris bulbs." [Correspondence.] 165 (4195), 495.

(25a) To count the number of Cyclops infected with Dracunculus in a mixed culture it is only necessary to put into the dish containing them sufficient crushed ice to cool the water to 8° to 9°C. At any temperature between 7·5°C. and 10°C. the Cyclops are effectively immobilized, but the contained Dracunculus larvae remain active and can easily be observed with a binocular microscope. The Cyclops are undamaged and revive when returned to the culture jar at normal temperature. R.T.L.

(25b) Jones describes *Heterodera carotae* n.sp., a cyst-forming species attacking carrots at Chatteris, Isle of Ely. It has lemon-shaped cysts, but they differ from those of *H. schachtii* in size and shape and in the possession of a large egg-sac into which many eggs are extruded. The male spicules resemble those of *H. schachtii* and *H. cruciferae*, but the larvae are longer than those of *H. cruciferae*, averaging 454 μ as compared with 418 μ. One hundred and six plant species, including the hosts of the other common species of *Heterodera*, were tested with *H. carotae* but only cultivated and wild carrot were attacked. M.T.F.

(25c) Leech criticizes Emik's method [see Helm. Abs., 18, No. 85a] of analysing a set of weekly counts of trichostrongylid eggs from sheep. The chief error arises from considering successive weekly counts from the same animal as if they were independent, and from thus treating "weeks" as an independent variate. This logical fallacy leads to an underestimation of the error variance. B.G.P.

(25d) When *Schistocephalus solidus* is reared at 40°C. in sterile liquid media, with the *p*H carefully controlled, embryonated eggs are produced but only about 5% form normal full-sized coracidia which hatch normally. As the receptaculum seminis is devoid of spermatozoa it is suggested that their development is parthenogenetic. R.T.L.

(25e) This announces very briefly that the eelworm causing disease in Dutch, English and Spanish varieties of bulbous iris is *Ditylenchus destructor*, the potato tuber eelworm. J.B.G.

26—New Zealand Journal of Agriculture.

a. ANON., 1950.—"Diseases and parasites affecting pigs." 80 (1), 63, 65, 67–68.

27—North American Veterinarian.

a. MEGINNIS, P. J., 1950.—"One phase of today's horse practice." 31 (4), 226–229. References p. 233.

b. HOERLEIN, B. F., 1950.—"The evaluation of various chemical agents in the treatment of soil infected with larvae of the dog hookworm (*Ancylostoma caninum*)." 31 (4), 253–262.

(27b) Experiments with boron products, methyl bromide, urea, dichloropropylene, ethylene dibromide and calcium cyanamide for the sterilization of soil samples artificially and naturally infected with *Ancylostoma caninum* larvae showed that methyl bromide and sodium borate were effective, while calcium cyanamide and dichloropropylene were fairly effective. Sodium borate, urea and calcium cyanamide, which can be spread on the surface, are most easily applied. Sodium borate was found to be relatively non-toxic to dogs but calcium cyanamide was toxic when administered internally. R.T.L.

28—Ophthalmologica. Basle.

a. WITENBERG, G., JACOBY, J. & STECKELMACHER, S., 1950.—"A case of ocular gnathostomiasis." 119 (2), 114–122. [French & German summaries p. 121.]

(28a) Witenberg et al. record the first case of human gnathostomiasis in the Near East. The patient had gone to Palestine from Germany about 12 years previously. The migration of the larva was accompanied by neuralgic symptoms and inflammation. It was eventually removed surgically from the edge of the cornea. Since the structure of the larvae of all gnathostomes has not been studied it is not possible to determine the species, but it is thought to be *G. spinigerum*. Two photomicrographs of the larva are included. They also record the finding of adult *G. spinigerum* in the stomach of *Catolynx chaus* in Palestine. A.A.S.

29—Parasitology.

a. HAMILTON, A. G., 1950.—"The occurrence and morphology of *Coenurus serialis* in rabbits." **40** (1/2), 46–49.
b. BAYLIS, H. A., 1950.—"A review of the species of *Dinobothrium* (Cestoda), with a description of a new species." **40** (1/2), 96–104.
c. REES, G., 1950.—"Observations on the vertical migrations of the third-stage larva of *Haemonchus contortus* (Rud.) on experimental plots of *Lolium perenne* S24, in relation to meteorological and micrometeorological factors." **40** (1/2), 127–143.
d. JONES, T. W. TYSSUL, 1950.—"Anopheline larvae as intermediate hosts for larval trematodes." **40** (1/2), 144–148.

(29a) Hamilton reports the occurrence of two specimens of *Coenurus serialis* in two laboratory-bred female rabbits, and gives a series of excellent photographs of the material he describes. The duration of these accidental infections is estimated at 18–24 months. While numerous external daughter coenuri were found within the same adventitious cysts of the parent coenuri, there were no internal daughter coenuri. The only internal structures apart from normal scolices were vesicular scolices which appeared to Hamilton to be undergoing a process of degeneration. From this negative evidence, as against the positive evidence of previous workers, Hamilton concludes that the only daughter coenuri ever to develop from a parent coenurus are external to it and not internal. H.C.

(29b) Baylis describes *Dinobothrium spinosum* n.sp. from *Cetorhinus maximus*. The neck and the bothria are covered with flat cuticular spines. The cirrus-sac is large and the vas deferens acts as a seminal vesicle. The testes number 20–30. There is no natural uterine opening and the eggs are liberated by dehiscence of the segment ventrally. He regards *D. septaria* and *D. planum* as valid species, but *D. keilini* and *D. plicitum* as very doubtfully valid. P.A.C.

(29c) Rees investigated the cycle of vertical migration of infective larvae of *Haemonchus contortus* which were placed on plots of *Lolium perenne* out of doors, and related this behaviour with meteorological and micrometeorological factors. Of all the factors examined it appeared that a favourable combination of temperature, humidity and light is necessary for vertical migration of the larvae on the grass blades. Light seems to be the prime factor in determining the time of day for the maximum amount of migration. Early morning and evening are the most favourable times for migration, fewer larvae being recovered during the day and at night. Low humidity with either high or low temperatures inhibits vertical migration. During rain the two daily maxima still occur but are less than in the absence of rain. J.J.C.B.

(29d) Tyssul Jones describes an unencysted cercaria from the thoracic cavity of 40% of *Anopheles culicifacies*, 68% of *A. aconitus* and 12% of *A. annularis* in Ceylon. Cercariae were also recovered from the region of the second and third abdominal segments but were fewer in number than in the thorax. He believes that encystment occurs in the adult mosquito and that the adult fluke is a parasite of a bat or of a bird, possibly a member of the swallow family. The name *Cercaria ceylon* I is permissible for this cercaria but "for the sake of easy reference" he proposes the name *C. anophelini*. P.L.leR.

30—Phytopathology.

†a. DIMOCK, A. W. & FORD, C. H., 1950.—"Control of foliar nematode disease of chrysanthemums with parathion sprays." **40** (1), 7.
†b. LEAR, B., 1950.—"Efficacy of dichlorobutene as a soil fumigant against *Heterodera rostochiensis* Wollenweber and *Heterodera marioni* (Cornu) Goodey." **40** (1), 17.
†c. LEAR, B. & MAI, W. F., 1950.—"Use of methyl bromide for killing golden nematode cysts on used bags and in soil samples." **40** (1), 17.
†d. LOWNSBERY, B. F., 1950.—"Stimulation of golden nematode larvae by root leachings." **40** (1), 18.

† Abstract of paper presented at the 41st Annual Meeting of the American Phytopathological Society, New York City, December 28 to 30, 1949.

†e. MAI, W. F., 1950.—"Effect of high soil populations of the golden nematode, *Heterodera rostochiensis* Wollenweber, on the yields of Irish Cobbler and Green Mountain potatoes." **40** (1), 19.

†f. TARJAN, A. C., 1950.—"Parathion therapy of meadow nematode-infected boxwoods." **40** (1), 27.

†g. TODD, F. A., LUCAS, G. B. & MOORE, E. L., 1950.—"Chemical treatment of tobacco plant bed soils for weed and disease control." **40** (1), 29.

h. RASKI, D. J., 1950.—"The life history and morphology of the sugar-beet nematode, *Heterodera schachtii* Schmidt." **40** (2), 135–152.

i. LIAO, S. C. & DUNLAP, A. A., 1950.—"Arrested invasion of *Lycopersicon peruvianum* roots by the root-knot nematode." **40** (2), 216–218.

(30a) Dimock & Ford tested various insecticides as sprays against the chrysanthemum leaf nematode (*Aphelenchoides ritzema-bosi*). Chrysanthemum plants in 20- and 10-plant plots at two centres were inoculated with infected leaves scattered over all plots two or three times during the season, and frequent overhead irrigation was employed. Only parathion was appreciably effective. At one centre the total infected leaf count for all plots was 1,296 in the controls while with parathion wettable powder at 0·25 lb. and 0·50 lb. active per 100 gal. it was 1 and 0 respectively. At the other centre parathion wettable powder at the lower dosage gave nearly perfect control and a parathion emulsion at 0·17 lb. active per 100 gal. was good but less effective. Chlordane, benzene hexachloride, tetraethylpyrophosphate, D.D.T. and nicotine sulphate failed to approach the same degree of effectiveness. **M.T.F.**

(30b) Lear has found dichlorobutylene very effective against *Heterodera rostochiensis* and *H. marioni*. Both parasites were eliminated by injecting 0·5 ml. into 1-gal. glazed pots of soil, and 0·25 ml. gave excellent control. In the field, 3·2 ml. 4 inches deep at 10-inch centres reduced *H. rostochiensis* by 91% and gave an 11·7-fold increase in yield of potatoes. In comparison, D-D mixture diffused further and left the soil more rapidly. **B.G.P.**

(30c) Lear & Mai have completely killed *Heterodera rostochiensis* cysts in burlap potato bags in sealed containers, using methyl bromide at 6 ml. per cu. ft. for 16 hours, or 12 ml. for two hours. Bags were treated 600 at a time, in tied bundles of 50. All cysts were also killed in 10-lb. samples of soil in open paper bags. Temperatures were above 65°F. **B.G.P.**

(30d) Lownsbery recommends the use of root diffusate hatching tests as a method of estimating the viability of *Heterodera rostochiensis*. He records the development of a rapid new method for extracting cysts from soil and finds it possible to obtain equal-sized batches of cysts by weighing. He obtains his root diffusate by leaching potato plants. Hatching is claimed to occur between 15°C. and 30°C. with an optimum at 21°C. Light inhibits the process. **D.W.F.**

(30e) Mai records the use of Shell D-D against *Heterodera rostochiensis* on heavily infested soil. In the spring of 1948 there were 19·5 viable cysts per ounce of soil on the control areas and 0·04 on the treated areas. The corresponding figures for the spring of 1949 were 17·3 and 0·27 respectively. Irish Cobbler (an early variety of potato) and Green Mountain (a late variety) were planted in 1948 and 1949. In the case of Irish Cobbler there was a decrease in weight of U.S. No. 1 tubers on the heavily infested areas of 60% in 1948 and of 68% in 1949. With Green Mountain reductions of 84% and 72% were obtained. In 1948 Green Mountain outyielded Irish Cobbler on the treated area, but this difference was not significant in 1949. **D.W.F.**

(30f) Tarjan reports on the efficiency of parathion applied as a drench for the control of the meadow nematode to five-month-old boxwood plants growing in 5-inch pots.

† Abstract of paper presented at the 41st Annual Meeting of the American Phytopathological Society, New York City, December 28 to 30, 1949.

A solution of 2·5 gm. of 25% wettable powder in 50 c.c. water significantly reduced the nematode population in the roots, as compared with untreated controls. Treatments made with 4 gm. or more of the powder per 50 c.c. proved phytotoxic. Application at the rate of 1, 1·5 and 2 lb. of the powder round 14-year-old boxwood bushes, watered in with 3 gal. water, gave lower counts of the nematode than in roots of the controls. T.G.

(30g) Todd et al. have tested a number of soil fumigants against weeds, fungi and root-knot on old tobacco bed soils. The following were effective against root-knot: methyl bromide gas at 2 lb. per 10 sq. yd.; 255 ml. per sq. yd. of a 15% methyl bromide solution in xylene + 85 ml. chloropicrin per gal.; 1 lb. cyanamide + $\frac{1}{4}$ lb. sodium azide per sq. yd.; "sodium nitrite-nitrate" at 1 lb. per sq. yd. Root-knot was also reduced by allyl alcohol at 8 quarts per 100 gal. water applied at 1 gal. per sq. yd. B.G.P.

(30h) Raski gives a full illustrated account of the development of the sugar-beet nematode and of the morphology of the various stages. He finds that there are five stages and four moults, the first of which occurs within the egg. The second-stage larva hatches from the egg and penetrates the host root. After seven days the second moult occurs and in the third stage the female can be distinguished from the male by her larger median oesophageal bulb and by the paired gonads as compared with the single testis in the male. The third moult occurs about four days later; the male completes its development within the third larval skin and emerges after a fourth moult about 20 days after entering the host root. The female grows rapidly after the third moult and moults again 3–4 days later when it takes on the typical lemon shape and the vulva is formed. Development is complete in 16–17 days after penetration of the host root and the first eggs develop by about the 24th day. Coiled larvae in the eggs were first seen on the 31st day and the first brown cyst was found on the 36th day. The observations were carried out daily on plants grown in a greenhouse in which the average soil temperature was 66·8°F. Larvae were found capable of hatching as soon as they were fully developed and under these conditions several generations may be completed in a year. M.T.F.

(30i) Seeds of *Lycopersicon peruvianum* and *L. esculentum* were sown in soil infested with *Heterodera marioni*, and two days after the seedlings had emerged the roots were carefully removed from the soil and stained in Flemming's strong fluid. Nematodes were abundant in *L. esculentum*, but in *L. peruvianum* very few had penetrated and most of these were superficial or had only half entered the root. In another experiment the seedlings were grown for four weeks: those of *L. esculentum* turned yellow and died, while only three of 40 *L. peruvianum* seedlings showed typical root-knot swellings and none showed above-ground symptoms of disease. Nearly all the nematodes were found clustered round the young roots breaking through the cortex of the main root: many had died when only halfway into the root. As no structural differences between the roots of the two species of *Lycopersicon* could be seen it is suggested that a chemical inhibitor may be present in the resistant species. M.T.F.

31—Proceedings of the Annual Meeting. British Medical Association.

a. STEFANOPOULO, G. J., 1950.—"The symptomatology, diagnosis and treatment of filariasis due to *Loa loa*." Year 1949, pp. 283–287.
b. HAWKING, F., 1950.—"Recent advances in the treatment of schistosomiasis, filariasis and typhus." Year 1949, pp. 287–290.

(31a) During a period of 15 years Stefanopoulo has been able to follow up in Paris nearly 500 European cases of *Loa loa* contracted in tropical Africa. Among the clinical symptoms described, filarial prurigo is liable to cause error in diagnosis on account of

its intensity and the skin eruption. Extremely severe itching is accompanied by attacks of erythema associated with a polymorphic or papulo-vesicular rash. Scratching is inevitable and may result in lesions which tend to become impetiginous. Some lesions resemble chronic eczema or become thickened and resemble lichen planus. As microfilariae are found in the blood in only 20–30%, an intradermal or complement-fixation test is of great value. Hetrazan is a specific cure. The most common reaction is a reactivation of the filarial lesions as indicated by oedema, stinging and pruritus after the first administration of the drug. In the majority of cases symptoms tend to recur and a second course of treatment is required. Changes in the eosinophilia afford a biological test, an increase indicating the need for further treatment. The use of hetrazan as a prophylactic is suggested. R.T.L.

(31b) Hetrazan, in Hawking's opinion, will become very useful in mass treatment of whole villages and districts infected with *Wuchereria bancrofti*, as most of the microfilariae will be kept out of the blood of carriers for long periods although the adult worms will not be killed. In onchocerciasis mass treatment is not likely to be practicable owing to the violent allergic reactions and to the ineffectiveness of hetrazan against the adult worms in the nodules. Hawking recommends Blair & Alves' method of administering tartar emetic for schistosomiasis by using six injections within two days. He states that the oral administration twice daily for six days of 0·6 gm. of Miracil-D by Blair resulted in the cure of 90% of patients infected with *Schistosoma haematobium*. R.T.L.

32—Proceedings of the Society for Experimental Biology and Medicine.

a. ROSS, O. A. & BUEDING, E., 1950.—"Survival of *Schistosoma mansoni in vitro*." 73 (2), 179–182.

(32a) Ross & Bueding describe a method for studying the survival *in vitro* of *Schistosoma mansoni* obtained from the mesenteric and portal veins of mice. The parasites survived in sterile horse serum for 14–18 days and in serum ultrafiltrate for 10–12 days. In a medium containing 41 different chemicals they survived only 12–18 hours. The addition of an aqueous extract of beef muscle or of a purified fraction of protogen to this synthetic medium increased the period of survival significantly. The worms survived in completely anaerobic conditions for five days while *Litomosoides carinii* survived for not more than 12 hours. Under aerobic conditions the period of survival was doubled in the case of the schistosomes. P.L.leR.

33—Report of the Department of Agriculture, Cyprus.

a. CHAMBERS, P. C., 1950.—"Animal health." Year 1949, p. 5.

(33a) Throughout the year 1949, cases of parasitic gastro-enteritis in Cyprus were low, owing to the unfavourable conditions which resulted from the long dry season. Verminous bronchitis and liver-fluke were reported chiefly from the western half of the island but did not cause serious loss. R.T.L.

34—Revista Ibérica de Parasitología.

a. BACA PUERTA, A., 1950.—"El *Enterobius vermicularis* como agente patogénico de crisis apendiculares verdaderas y falsas." 10 (1), 3–55. [English summary p. 52.]
b. LÓPEZ-NEYRA, C. R., 1950.—"Revisión del género *Cotugnia*, motivada por el estudio de una especie nueva, hallada en la tórtola de Granada." 10 (1), 57–96. [English summary p. 94.]
c. JORDANO, D., 1950.—"Hallazgo en España de *Diplopylidium triseriale* (Lühe) (Cestoda Dilepididae) y demostración biométrica de la validez de esta especie." 10 (1), 97–124. [English summary p. 118.]

(34b) The definition of the genus *Cotugnia* is restricted and differentiated from *Multicotugnia* López-Neyra, 1934 in which there is a single species, *M. brotogerys*. Twenty-seven species of *Cotugnia* s.str., including *C. dollfusi* n.sp. from *Streptopelia turtur*, are described and a key is provided. R.T.L.

(34c) *Diplopylidium triseriale* in *Genetta genetta* is recorded from Spain for the first time. Biometric studies show that *D. triseriale* and *D. acanthotetra*, which Witenberg believed to be identical, are different species. R.T.L.

35—Rivista di Parassitologia.

a. ROSSI-ESPAGNET, A., 1950.—"Studio sulla comparsa di proteasi specifiche di difesa in soggetti infestati da *Ascaris lumbricoides*." 11 (1), 55–59. [English & French summaries p. 59.]

(35a) In tests on substrates from the cuticular and subcuticular layers, the muscular layer, and the internal organs of *Parascaris equorum*, Rossi-Espagnet obtained a positive Abderhalden reaction with the substrate from the muscular layer in nine out of ten subjects infected with *Ascaris lumbricoides*. R.T.L.

36—Science.

a. LARSH, Jr., J. E., 1950.—"Relationship in mice of intestinal emptying time and natural resistance to pig Ascaris infection." 111 (2873), 62–63.
b. PRINCE, M. J. R., 1950.—"Studies on the life cycle of *Syphacia obvelata*, a common nematode parasite of rats." 111 (2873), 66–67.
c. DOUGHERTY, E. C., 1950.—"Sterile pieces of chick embryo as a medium for the indefinite axenic cultivation of *Rhabditis briggsae* Dougherty and Nigon, 1949 (Nematoda : Rhabditidae)." 111 (2880), 258.

(36a) Only those mice which received 30,000 eggs of pig Ascaris showed larvae in pressed lung sections 5–8 days after infection, whereas guinea-pigs had previously been shown to have lung invasion from as few as 6,600 eggs. Mice injected with 1% morphine sulphate to slow their intestinal emptying time had numerous larvae in the lungs whereas the controls were negative. The rapid emptying time of mice is probably an important factor in their strong resistance to initial infection. R.T.L.

(36b) Attempts to infect rats with *Syphacia obvelata* by feeding them with whole gravid females or with eggs liberated from gravid females were unsuccessful. Eggs cultured at 20°C. or 37°C. in distilled water, tap-water, dilute formalin or moist air failed to infect test rats. When the anal region of an infected rat was washed the liquid contained a fairly large number of embryonated eggs and some larvae. About 25% of the eggs were empty. This suggests that rats become infected by licking embryonated eggs or larvae from the anal region. Some evidence of "retrofection" was obtained. R.T.L.

(36c) At least 12 successive generations of *Rhabditis briggsae* (syn. *R. elegans* of Dougherty & Calhoun, 1948 and of Nigon, 1949) have now been reared on sterile pieces of chick embryo. The rate of growth on this medium is slow and maturation takes not less than six days at 16°C., due probably to the absence of sufficient growth factors or the presence of inhibitory substances. R.T.L.

37—Tierärztliche Umschau.

a. PUSCH, J., SENNE I & BEYER, W., 1950.—"Ein verbessertes, einfaches Verfahren zum Nachweis von Parasiteneiern in Kotproben." 5 (3/4), 54–55.

(37a) Diagnosis of parasite eggs in mass examination of faecal samples can be facilitated by staining flotation samples with 3 drops of a 2% aqueous solution of yellow water-soluble eosin. The specimen in a flat-bottomed petri dish, which should be no more than shining wet, is then examined microscopically by daylight. Eggs show a green fluorescence and their structure is readily seen. Plant remains and the general matrix are stained red. The contrast is heightened by the use of a blue filter. Specimens preserved in 10% formalin can also be examined in this way. E.M.S.

38—Tijdschrift over Plantenziekten.

a. OORT, A. J. P., 1950.—"Nederlandse namen voor aaltjes (nematoden)." **56** (2), 169–171.

(38a) Oort gives a table setting out the scientific names of the chief plant-parasitic nematodes occurring in Holland, with synonyms, old name, suggested name and name of disease caused. The genera listed are *Heterodera, Ditylenchus, Aphelenchoides* and *Pratylenchus*. [The table is intended primarily for the guidance of agriculturists in Holland.] T.G.

39—Transactions of the American Microscopical Society.

a. KUNTZ, R. E., 1950.—"Embryonic development of the excretory system in fork-tailed cercariae of the schistosomes and in a blunt-tailed brachylaemid cercaria." **69** (1), 1–20.
b. WOODHEAD, A. E., 1950.—"Life history cycle of the giant kidney worm, *Dioctophyma renale* (Nematoda), of man and many other mammals." **69** (1), 21–46.
c. MACY, R. W., 1950.—"Anomalies in the trematode *Prosthogonimus macrorchis* with special reference to rudimentary vitellaria and effect on egg shell formation." **69** (1), 47–49.
d. CIORDIA, H., 1950.—"The chromosomes of *Notocotylus filamentis* Barker, 1915, a monostome from the muskrat (*Fiber zibethicus*)." **69** (1), 64–65.

(39a) Kuntz has studied the development of the excretory system in 15 species of cercariae belonging to 10 different families. Except for minor modifications and slight morphological differences the development in *Schistosoma haematobium, S. mansoni* and *S. japonicum* is very similar. The number of flame cells and ciliated areas of the primary collecting tube, the presence of an island of Cort, and the definitive pore of the excretory bladder and the excretory atrium at the junction of body and tail, are discussed in the light of previous observations. As members of the Brachylaemidae have received relatively little attention, the blunt-tailed cercaria of *Panopistis* sp. is also described. The remainder of the 15 species are to be considered in later papers. R.T.L.

(39b) Woodhead now gives an illustrated and detailed account of the various stages of the life-cycle of *Dioctophyme renale*, which he published in abstract form in 1945. The eggs of *D. renale* obtained from wild mink hatched in the foregut of branchiobdellids, *Cambarincola chirocephala*, collected from crayfish. The first-stage larvae penetrate into the body tissues where they moult to form Gordius-like larvae which encyst. *C. chirocephala* containing these second-stage larvae are eaten by bullheads. The larvae migrate to the mesenteries and liver of the fish, encyst and moult into third-stage larvae, and after a further moult become the fourth-stage infective larvae. When eaten by various mammals these larvae excyst and penetrate into the kidney or body-cavity where they become adult. Of 388 wild mink from the southern counties of Michigan, 30 were infected. After 1–3 years *D. renale* dies and the kidney shrivels and dries up. R.T.L.

(39c) Macy reports that among a large number of specimens of *Prosthogonimus macrorchis* he found three examples of complete monorchism, a specimen with two normal

testes and a smaller one which was functional, and a specimen in which the uterus, cirrus-sac and seminal vesicle were absent and the ootype region was abortive. In two specimens the vitelline glands were rudimentary with a corresponding lack of yolk and shell in the uterus, although Mehlis' gland was normal. The uterus contained a mass of sperm and naked egg cells. This supports the view that shell material is produced by the vitellaria, not by Mehlis' gland which in Tyzzer's opinion is an activator. R.T.L.

40—Transactions of the Royal Society of Tropical Medicine and Hygiene.

a. SHORTT, H. E., 1950.—"*Microfilaria melleri* in *Chameleon melleri*." [Demonstration.] 43 (4), 351.
b. LEROUX, P. L., 1950.—"*Onchocerca gutturosa* infestation in cattle in Wales." [Demonstration.] 43 (4), 351–352.
c. LEROUX, P. L., 1950.—"*Bilharziella*." [Demonstration.] 43 (4), 352.
d. SANDOSHAM, A. A., 1950.—"Some species of *Enterobius* from primates." [Demonstration.] 43 (4), 352–354.
e. WILLMOTT, S., 1950.—"A new species of *Paramphistomum* from Scottish cattle." [Demonstration.] 43 (4), 354.
f. BERTRAM, D. S., 1950.—"Cotton rat filariasis: factors affecting the intensity of infection in the vector, *Liponyssus bacoti*." [Demonstration.] 43 (4), 354.
g. KERSHAW, W. E., 1950.—"The treatment of experimental filariasis with MSb (Friedheim)." [Demonstration.] 43 (4), 355–356.
h. HAWKING, F., LAURIE, W., SEWELL, P. & THURSTON, S., 1950.—"Investigations on the antifilarial action of hetrazan on *Litomosoides*, *Wuchereria bancrofti* and *Onchocerca volvulus*." [Demonstration.] 43 (4), 360.
i. LUBRAN, M., 1950.—"The blood concentration and urinary excretion of hetrazan." [Demonstration.] 43 (4), 360.
j. HUGHES, M. H. & DALY, P. J., 1950.—"Ocular onchocerciasis." [Demonstration.] 43 (4), 362.
k. MURGATROYD, F. & WOODRUFF, A. W., 1950.—"The effect of 'Banocide' (hetrazan) on adult forms and microfilariae of *Loa loa*." [Demonstration.] 43 (4), 365.
l. GORDON, H. McL., 1950.—"Two counting chambers for the enumeration of helminth ova." [Demonstration.] 43 (4), 366.
m. ENGLER, G. & SANCHEZ, G., 1950.—"*Capillaria hepatica* (Bancroft, 1893). A case report." 43 (4), 443–444.
n. NWOKOLO, C., 1950.—"Studies in onchocerciasis. (A review of 100 cases from Enugu district of eastern Nigeria)." 43 (5), 493–501.
o. STANDEN, O. D., 1950.—"The concentration of cercariae of *Schistosoma mansoni* for the preparation of cercarial antigen." 43 (5), 527–530.
p. WOODMAN, H. M., 1950.—"Filaria in the Sudan." [Correspondence.] 43 (5), 549–550.

(40d) By using Buckley's hanging-drop technique a pair of small sessile papillae lateral to the most anterior pair of pedunculated papillae are visible on the tail of the male *Enterobius vermicularis*. *E. vermicularis* is reported from *Pan satyrus*. The occurrence of new *Enterobius* species from *Pongo pygmaeus*, *Gorilla gorilla*, *Papio comatus* and unidentified species from *Cercopithecus aethiops* and *Leontocebus rosalia* is reported but they are not named or described. R.T.L.

(40e) From cattle killed on the Island of Mull and in Glasgow, Willmott has collected *Paramphistomum cervi* and a new species which is not here named or described. R.T.L.

(40g) In experimental filariasis in the cotton-rat, one intraperitoneal injection of 250 mgm. per kg. body-weight of MSb (Friedheim) showed prophylactic activity for six months. This drug would appear to be effective against the adult worms and to have little action on the embryos in the circulation. R.T.L.

(40h) [This work has been described in the *Lancet*. For abstracts see Helm. Abs., 17, No. 319c; 18, No. 414c.]

(40m) This case is suspected to be one of pseudo-infection. The eggs of *Capillaria hepatica* which occurred in the faeces were probably derived from the consumption of the liver of wild animals fried in sesame oil. R.T.L.

(40n) Nwokolo describes the clinical signs and symptoms of "onchodermatitis", with special reference to its distribution on the body, in a study of 100 cases of onchocerciasis from Enugu, Nigeria. Two types are recognizable: the regional type which usually affects one limb only, and the generalized type in which the limbs and trunk are affected. Out of a total of 59 cases of onchodermatitis, 20 were of the regional type. Probably 3–7% of cases of onchocerciasis exhibit dermatitis. In the 100 cases studied no "onchophthalmia" was seen, although seven had scalp nodules. The distribution of 89 nodules collected in the series was: iliac crest 22, ribs 17, trochanters 13, spine 11, knee 10, scalp 7, scapula 3, sacro-iliac joint 2, root of neck 2, ischial tuberosity 1, wrist 1. J.J.C.B.

(40o) Standen accepts the view that cercariae of mammalian schistosomes should provide the most satisfactory and potent antigens for the diagnosis of schistosomiasis in man. He describes his technique for concentrating the cercariae of *Schistosoma mansoni* and freeing them of snail faeces and micro-organisms. Speed of operation to prevent the death of the cercariae and consequent leaching-out of antigenic substances before completion of filtration is emphasized. P.L.leR.

(40p) Replying to comments by Bloss [see Helm. Abs., 18, No. 278a], Woodman states that *Chrysops* are seldom found in the Sudan except on cattle. There is great variation in the numbers of certain species of biting flies in different years. He maintains that there is strong evidence that there is a vector of *Loa loa* other than *Chrysops*. In a survey in the area Sué II, 77% of the skin tests for Onchocerca embryos were positive but no ophthalmoscopic examinations were made. R.T.L.

41—Veterinary Medicine.

a. QUIN, A. H., 1950.—"A report on control of equine sclerostomes with fractional daily doses of phenothiazine." 45 (1), 47–48.
b. EVELETH, D. F. & GOLDSBY, A. I., 1950.—"Nicotine arsenate-copper sulfate as a sheep anthelmintic." 45 (3), 115–118, 128.
c. OLSEN, O. W., 1950.—"*Pseudostertagia bullosa* (Ransom and Hall, 1912) Orlov, 1933, from New Mexico sheep, with a note on the gubernaculum." 45 (4), 163–164.
d. TODD, A. C., HANSEN, M. F., KELLEY, G. W., WYANT, Z. N. & HULL, F. E., 1950.—"The development of helminthiasis in Thoroughbred foals in central Kentucky." 45 (5), 181–186, 195.

(41a) Quin maintains that he obtained complete control of strongyles or a reduction to subclinical level in 16 Thoroughbred yearlings given a daily dose of 30 grains phenothiazine together with riboflavin, vitamin D, calcium, phosphorus and trace elements for three weeks, followed by one week without medication; this was carried out for 12 weeks. It is stated that there were heavy strongyle egg counts before treatment but only the counts at the 9th and 12th weeks are recorded. [No mention is made of previous workers having shown that phenothiazine in small daily doses depresses egg-laying of horse strongyles without necessarily removing the parasites.] J.W.G.L.

(41b) Copper-nicotine mixture is less effective than phenothiazine for nematodes but more potent against tapeworm. An account is given of experiments on five sheep with tablets containing nicotine arsenate 1·87 gm., copper sulphate 1 gm. with a filler. Some flocks tolerated the dose without loss but in other flocks the mortality was high. The factors responsible for the lower tolerance of some individuals to nicotine arsenate have not been

determined. Tables give the toxicity of the tablets, of a nicotine arsenate and copper sulphate drench, the anthelmintic efficiency of copper sulphate with nicotine arsenate, and the amounts of arsenic stored in the liver after the administration of various doses of arsenic. R.T.L.

(41c) *Pseudostertagia bullosa*, already seen in Montana, South Dakota and Colorado, is now reported from New Mexico. The peculiar shield-shaped gubernaculum is figured. R.T.L.

(41d) [With insignificant textual changes this article reproduces *Bull. Ky agric. Exp. Sta.*, 1949, No. 541, 24 pp. For abstract see Helm. Abs., 18, No. 345c.]

42—Veterinary Record.

a. PURCHASE, H. S., 1950.—" 'Hetrazan' in the treatment of *Dirofilaria immitis* (Leidy 1856)." 62 (3), 34.
b. JOHNSON, J. E., 1950.—" Verminous aneurysm : cause of recurrent colic in the horse ? " 62 (4), 45–47.
c. ANON., 1950.—" Sodium fluoride as an anthelmintic for pigs." [Questions & Answers.] 62 (7), 97.
d. LUKE, D. & GORDON, W. A. M., 1950.—" Observations on some pig diseases." 62 (13), 179–185. [Discussion p. 185.]
e. ANON., 1950.—" Deaths of pigs following administration of worm powder : judgment for veterinary surgeons." 62 (15), 233.
f. LUKE, D. & GORDON, W. A. M., 1950.—" Sodium fluoride in the pig." [Correspondence.] 62 (15), 234.

(42a) Purchase records the successful use of hetrazan in a dog infected with *Dirofilaria immitis*, after fouadin and stibophen had not produced a cure. A preliminary trial of 3 mgm. of hetrazan per kg. body-weight daily, divided into three doses per day for 14 days was not found to be a sufficient dose, but when this was increased to 5 mgm. per kg. daily for three weeks a cure was effected. As a precaution against embolus formation the necessity of restraining the dog is emphasized. J.W.G.L.

(42b) A detailed clinical picture is given of a case of recurrent colic in a horse over a period of seven days. Post-mortem examination revealed a calcified swelling of 1½ pints capacity thought to be an aneurysm of the aorta and probably caused by *Strongylus* infection. J.W.G.L.

(42d) The original dosage of sodium fluoride recommended for Ascaris in pigs was 1% of the feed, calculated as dry meal. When swill is used, or where potatoes are added, 0·1–0·15 gm. per lb. body-weight is satisfactory and more convenient. It is pointed out that the ordinary commercial grade usually used contains 73% of pure sodium fluoride. R.T.L.

(42f) The standard dosage rates of 1% of the dry feed or 0·1–0·15 gm. per lb. body-weight for sodium fluoride against ascaris in pigs were based on a purity of 73%, i.e. the ordinary commercial grade. As samples of the drug now available have a purity of 95–98%, it is necessary to adjust the size of the dose accordingly. When this is done, the dose is efficient and without any alarming evidence of toxicity. E.M.S.

43—World Crops.

a. PETERS, B. G., 1950.—" Nematodes as crop parasites." 2 (1), 11–15.

(43a) Peters gives a popular account of the plant-parasitic eelworms, touchi upon disease in relation to eelworm population levels, and upon physical, chemical a biological control methods, referring briefly to the more important species. B.G.

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44—UNITED STATES DEPARTMENT OF AGRICULTURE, 1950.—" Index-catalogue medical and veterinary zoology. Part 11. Authors : N to Ozzard." Washington, D.C. : U. Government Printing Office, pp. 3483–3720.